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# ROYAL ONTARIO MUSEUM OF ZOOLOGY

## BULLETIN No. 9

TORONTO, NOVEMBER, 1940.

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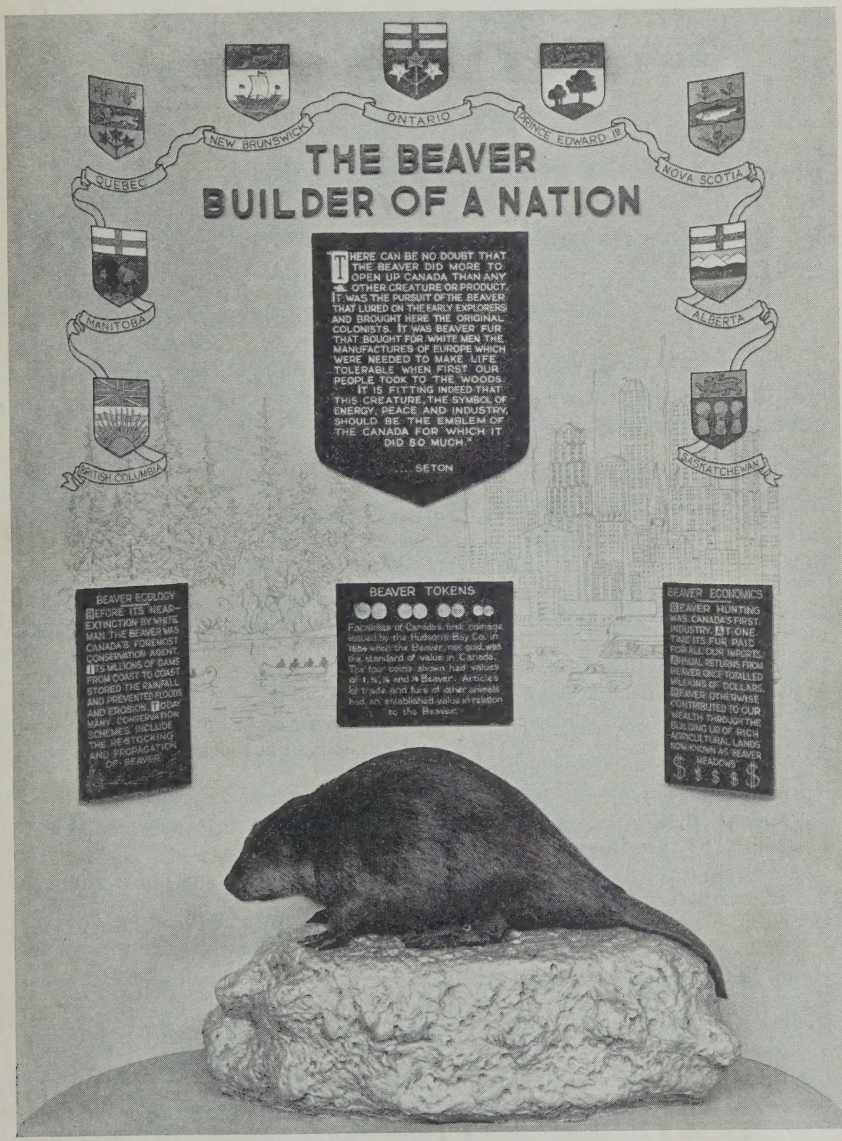

NEW BRUNSWICK
ONTARIO
PRINCE EDWARD IS.
QUEBEC
NOVA SCOTIA
THE BEAVER
BUILDER OF A NATION
THERE CAN BE NO DOUBT THAT THE BEAVER DID MORE TO OPEN UP CANADA THAN ANY OTHER CREATURE OR PRODUCT. IT WAS THE PURSUIT OF THE BEAVER THAT LURED ON THE EARLY EXPLORERS AND BROUGHT HERE THE ORIGINAL COLONISTS. IT WAS BEAVER FUR THAT BOUGHT FOR WHITE MEN THE MANUFACTURES OF EUROPE WHICH WERE NEEDED TO MAKE LIFE TOLERABLE WHEN FIRST OUR PEOPLE TOOK TO THE WOODS. IT IS FITTING INDEED THAT THIS CREATURE, THE SYMBOL OF ENERGY, PEACE AND INDUSTRY, SHOULD BE THE EMBLEM OF THE CANADA FOR WHICH IT DID SO MUCH."
— SETON
MANITOBA
ALBERTA
BRITISH COLUMBIA
SASKATCHEWAN
BEAVER ECOLOGY
BEFORE ITS NEAR-EXTINCTION BY WHITE MAN, THE BEAVER WAS CANADA'S FOREMOST CONSERVATION AGENT. ITS MILLIONS OF DAMS FROM COAST TO COAST STORED THE RAINFALL AND PREVENTED FLOODS AND EROSION. TODAY MANY CONSERVATION SCHEMES, INCLUDING THE RE-STOCKING AND PROPAGATION OF BEAVER, C
BEAVER TOKENS
Facsimile of Canada's first coinage, issued by the Hudson's Bay Co. in 1854 when the Beaver, not gold, was the standard of value in Canada. The four coins shown had values of 1, ½, ¼ and ¼ Beaver. Articles of trade and furs of other animals had an established value in relation to the Beaver.
BEAVER ECONOMICS
BEAVER HUNTING WAS CANADA'S FIRST INDUSTRY. IT ONE TIME ITS FUR PAID FOR ALL OUR IMPORTS. ANNUAL RETURNS FROM BEAVER ONCE TOTALLED MILLIONS OF DOLLARS. BEAVER OTHER WISE CONTRIBUTED TO OUR WEALTH THROUGH THE BUILDING UP OF RICH AGRICULTURAL LANDS NOW KNOWN AS BEAVER MEADOWS
$ $ $ $

...SEUM EXHIBIT ILLUSTRATING THE IMPORTANCE OF THE BEAVER TO CANADA

P.M
505
R888
no.9

## ACCESSIONS

The following table indicates the number of specimens of various kinds received by the Museum during the two years, October 1, 1938, to September 30, 1940.

| | Donated | Collected | Purchased | Exchanged | Total |
|---|---|---|---|---|---|
| Mammals | 514 | 1,214 | 134 | 11 | 1,873 |
| Birds | 33,415 | 1,281 | 542 | 107 | 35,345 |
| Birds' eggs (sets) | 229 | 83 | 16 | | 328 |
| Birds' nests | 100 | 72 | 1 | | 173 |
| Reptiles | 97 | 60 | | 1 | 158 |
| Amphibians | 94 | 341 | | 3 | 438 |
| Fish* | 734 | 497 | 29 | 9 | 1,269 |
| Insects | 1,536 | 4,277 | 2,000 | 66 | 7,879 |
| Spiders | 127 | 10,813 | | | 10,940 |
| Molluscs* | 1,446 | 307 | 3,506 | 616 | 5,875 |
| Other invertebrates | 265 | 265 | | | 530 |

*Included many lots sometimes made up of large numbers of specimens.

Apart from the Fleming library which has not yet been enumerated, additions to the library included 533 bound volumes and 6,158 unbound publications.

Among outstanding donations were the following:

BARRATT, the late FRED. 268 insects, mostly Coleoptera.
BOGGS, O. D. 26 birds, 2 nests, and 14 eggs from Ecuador and Peru.
BOWEN, Dr. H. M. 64 bird skins, mostly collected in California 1887-92. Donated with Messrs. C. F. Foster and Forest Nagler.
CLARKSON, Dr. F. A. Skin of the extinct Carolina Paroquet.
COCKBURN, R. R. Bearded seal from James Bay.
CROSS, E. J. Bay lynx.
CURTIS, M. W. 37 birds and 5 mammals.
DEEKS, D. B. 76 birds collected at Attawapiskat Post on James Bay.
DONOVAN, Mr. and Mrs. T. 69 lots of marine shells from Florida.
FIELDEN, Mrs. V. C. A champion Chow Chow.
FLEMING, the late J. H. 32,267 bird skins, 10 nests, and 32 sets of eggs.
FLETCHER, J. F. S. 7 lots of fish from Tetana Lake, northern British Columbia.
FOSTER, C. F. See BOWEN.
GOAD, Mrs. VICTOR A. E. 224 books and 130 unbound publications constituting the angling library of the late V. A. E. Goad.
GODDARD, WILLIAM. 66 mammals, 54 birds, and 19 fish from Favourable Lake, Patricia District, Ontario.
HAHN, PAUL. 4 Passenger pigeons.
HAMMELL, Mrs. J. E. Registered Brussells Griffon dog.
HERRINGTON, Rev. H. B. Several hundred lots of land shells from Hastings and Leeds counties.
HUDSON'S BAY COMPANY. 10 fish from Great Bear Lake.
HURLBURT, Dr. W. E. 85 Lepidoptera, 65 birds, 1 nest, and 3 eggs.
JOHNSON, TOM. Land shells from Favourable Lake, Patricia District, Ontario.
LA BINE, G. A. 4 ciscoes from Great Bear Lake.

LANG, K. H. 98 fish from Aklavik, N.W.T.
LA ROCQUE, A. 425 insects.
LEARMONTH, L. A. 20 birds from Fort Ross, Somerset Island, N.W.T.
MARSH, Dr. PHIL. 112 lots molluscs from Michigan and south-eastern United States.
MARSHALL, NELSON. 19 lots of Florida fishes.
McINTYRE, B. 116 Orthoptera.
NAGLER, FOREST. See BOWEN.
NATIONAL MUSEUM OF CANADA. 275 lots of Canadian marine shells.
NATIONAL PARKS BUREAU. Rocky Mountain caribou.
ONTARIO DEPARTMENT OF GAME AND FISHERIES. 2 pheasants, 2 mallards, 3 brown trout, and 24 lots of fishes.
RAWSON, Dr. D. S. 9 fish and 30 amphibians from Saskatchewan and Alberta.
REYNOLDS, KEITH. 42 birds.
RICHARDSON, G. H. 255 birds, 8 volumes Morris's *British Birds* and 1 volume Shaw's *General Natural History*.
RICKER, Dr. W. E. 150 stoneflies.
SCHNAUFER, T. A. 4 muskrat skins for exhibit, "Muskrat to Hudson Seal."
SCOVELL, Rev. G. S. Case containing 27 Australian birds, collected about 1880 by Geo. Scovell, his grandfather.
SHERBARTH, J. T. 28 volumes, ninth edition, *Encyclopedia Britannica*.
THOMPSON, STUART L. 40 miscellaneous insects.
TORONTO PARKS DEPARTMENT. 23 mammals and 9 birds.
WALKER, Dr. E. M. 281 Orthoptera.
WHELAN, R. V. Several feet of Kodachrome film and 96 insects.
WHITE, H. C. 51 fish.
WILMOT, Mrs. Pedigreed springer spaniel.
YOUNG, FRANK. 16 lots representing several varieties of the variable and beautifully coloured tree snails.

## FIELD WORK

Investigation of the natural history of the northern regions of Ontario was continued during the summers of 1939 and 1940 when expeditions were sent to the Attawapiskat and Severn River areas respectively. These surveys which were financed by a grant from the Reuben Wells Leonard bequest were carried out by C. E. Hope and L. A. Prince of the Museum staff and a student assistant, W. B. Scott.

Probably no area of comparable size in North America is less known, so far as natural history is concerned, than the Patricia portion of Kenora District in spite of the fact that this area was one of the first parts of Ontario whose natural history received attention. In 1768 Andrew Graham, Governor of the Hudson's Bay Company post at Severn River, sent a number of birds and mammals from that region to the Royal Society of England. Of the five species of birds new to science described as a result of this early collecting, four were obtained in series by our party which visited the same area during the summer of 1940. Another early student of natural history in the Hudson Bay region of Ontario was T. Hutchins, Governor of Fort Albany, who made extensive collections there and at Fort Severn, and about 1782 wrote an account of his work under the title,

"Observations on Hudson's Bay." This manuscript is still in the library of the Hudson's Bay Company unpublished.

In late May, 1939, our party flew north to Lansdowne House on Lake Attawapiskat. Twenty-six species of mammals were recorded for the area and 405 specimens representing 14 species secured for the Museum collection. In general, the mammal fauna was found to be similar to that of the Favourable Lake area visited the previous year.

Birds recorded totalled 90 species and 80 kinds were collected with a total of 405 specimens. Brewer's blackbird, which had not previously been collected in the province was secured. Western affinities of the bird fauna were apparent. The collection of reptiles totalled 8 specimens of one species and of amphibians 62 specimens of three species. Other material secured included 1,563 insects, 150 spiders, 23 lots of molluscs, and about 400 plant specimens.

In 1940 the same party left Toronto on June 4, reaching Ilford, Manitoba, from where they were to fly to Fort Severn on June 8. Unfavourable weather delayed the flight until June 15. On noon of that day the party reached Fort Severn and were soon established in a building placed at their disposal by the Hudson's Bay Company. Thirty-seven days were spent collecting specimens and making observations on the fauna of the region. The party left Fort Severn on July 23 on the Hudson's Bay Company schooner, *Severn*, and two days later reached Churchill, Manitoba. Four days were spent at Churchill during which time a white whale which had been captured was measured, photographed, and the skeleton roughed out and two embryos preserved. Toronto was reached on August 3.

The mammal collection, numbering 261 specimens, was obtained and prepared by Mr. Prince. Four species originally described from the area are represented by excellent series. These species are the cinereus shrew, saddle-back shrew, red squirrel, and meadow jumping mouse. Important information regarding fur-bearing and game mammals of the Severn region was obtained from Mr. J. E. J. Wilson, manager of the Hudson's Bay Company post.

The bird collection of 273 specimens was collected and prepared by Mr. Hope. Ninety species of birds were found to occur in the region; of these 75 are represented in the collection. Three species, viz., white-crowned sparrow, blackpoll warbler, and Hudsonian chickadee have Fort Severn as their type locality. An adequate series of each of these was obtained

Fishes, amphibians, and reptiles were collected by Mr. Scott. Records of 21 species of fish occurring in the area were obtained. Most of these are represented in the collection including eastern speckled trout (up to $3\frac{1}{2}$ lbs.). Only two species of frogs are known from the region.

Although the party did not include an entomologist, 1,200 specimens of insects were secured largely by Mr. Hope. These included a considerable collection of dragon flies. Much material in other groups including molluscs, spiders, rotifers, etc., as well as several hundred pages of notes and 200 photographs were obtained.

In 1939 an expedition from the Museum made a survey of the region from Cochrane north to Moosonee on southern James Bay. Messrs. Snyder, Shortt, and Downing of the staff, accompanied by Mr. D. B. Deeks, a volunteer collector, and two students, Messrs. G. H. Clawson and D. M. Kirk, made collections and field studies at four camps—Genier, Abitibi Canyon, Onakawana, and Moosonee.

Approximately 38 species of mammals were recorded for the region, 25 of which are represented in the collection. The total number of specimens in the collection was 475.

Bird work tabulated 113 birds for the region, 88 of which are represented in the collection. The total collection comprised 503 specimens, and represents one of the most complete and selectively balanced collections secured on our surveys.

No one accompanying the expedition was specially concerned with the collecting of fish but 26 specimens were secured. Other material obtained included 13 reptiles of one species and 59 amphibians of three species, 235 insects, 38 lots of molluscs, and other miscellaneous material.

Other members of the staff made field studies and collected material on their vacation or during short field excursions. The total number of specimens collected during the two summers is given in the table, page 2.

## MUSEUM EXHIBITION

Exhibits installed include two of the new style exhibits, one illustrating the beaver and its importance to Canada and the other the muskrat, showing the manufacture of Hudson seal from the skins of this prolific little fur-bearer. Another exhibit designed to illustrate the game, fur, and game fish resources of Ontario is nearing completion. Besides featuring these wild life resources, the exhibit will emphasize the work of the Ontario Department of Game and Fisheries in their management and conservation. Other additions were Rocky Mountain caribou, white-tailed deer, black fox, silver fox, bay lynx, pug dog, and wire-haired terrier. An interesting addition to the exhibits is a model of a house fly fifty times as large as the actual animal. Enlarged models of this kind are of great educational value since they show features such as the hairy legs and expanded tongue which offer such perfect devices for carrying disease organisms from the filth on which flies alight, to human food and utensils.

With the filling up of our gallery with permanent exhibits, attention is being given to temporary exhibits. Some of those arranged during the period covered by this report included reproductions of Audubon's bird paintings; sketches of animals made in our gallery by students of the Northern Vocational School; bird paintings by Fred Barratt; nature photographs by local naturalist photographers; works of Edwards and Catesby (which are among the earliest works on the natural history of North America); natural history notes and publications of Charles Fothergill, who came to Canada in 1816; and an exhibit of the results of the summers' field expeditions; recent donations by O. D. Boggs (birds of Peru and Ecuador), L. A. Learmonth (birds of the Arctic), Miss Jean Bodaly (birds of Portuguese West Africa), and the Rev. A. P. and Peter Quentin (birds of China); and Allan Brooks' bird paintings. Each year at Easter time the Toronto Aquarium Society arranges an exhibition of tropical aquarium fish which always attracts much favourable comment. A collection of living fishes, amphibians, reptiles, etc., is changed from time to time.

## "INFORMATION PLEASE"

Man is an inquisitive animal. No one knows this better than the staffs of natural history museums who answer thousands of questions each year. In a recent issue of *Natural History*, the journal of the American Museum of Natural History, the Director says that his institution is called on to answer 25,000 questions a year and that one-third of the time of the staff is devoted to answering questions asked by the public. He estimates that half of these questions are technical and deal with intricate scientific subjects; the other half, non-scientific and personal.

At the Royal Ontario Museum of Zoology we get our share of questions, scientific and personal. Some of the latter may appear trivial but to the inquirer every question presents a real problem. For instance, there was the lady who wanted to know the colour of a swan's bill.

"What kind of swan?" she was asked.

"Oh, it doesn't matter," she replied, "I'm doing a piece of fancy work and I wanted to use the right colour for the swan's bill."

Since the cross-word puzzle craze has died down we do not get so many questions such as, "What is a three-letter word of which the second letter is i, the native name of a Hawaiian fish?" We supplied the answer, "oio."

Questions come to us by letter, by telephone, and by personal call. In the average year we send out more than 2,500 letters, many of them

in answer to inquiries of one kind or another. The following list will give some idea of the variety of questions that come to us.

From a medical research institution asking if a mouse found to carry a certain type of tubercle bacillus in England also occurred in Canada, if not, what is its nearest relative here. Study of this bacillus may constitute an important advance in medicine.

From the same medical research institution asking for the name of an Australian rodent specially adapted for living under desert conditions.

What are the principal food fishes found in the Canadian Arctic?

How can I get rid of bats in my summer cottage?

Soap disappears from the washroom in our office. The janitor says rats are eating it. Do rats eat soap?

Scientists, naturalists, and others send us manuscripts to check zoological information. Magazines and newspapers consult the Museum when in doubt about the accuracy of articles and news items.

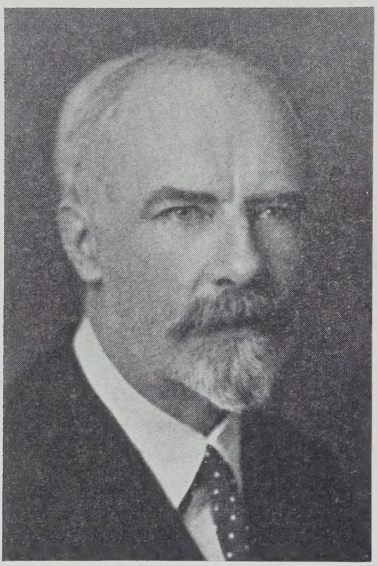
Boys' and girls' camps ask where they can get nature leaders.

A gardener asks our assistance in identifying the animal responsible for destroying his corn.

Assistance in the identification of specimens is one of the commonest requests made of the Museum. It is not always easy or possible to identify a bird, insect, or fish from a verbal description over the telephone or by letter. Often the animal concerned is known or suspected of being destructive. For instance, a lady telephoned to know if the little flat insects running around in the house she had just moved into, would eat her good rugs. Often the correct identification of an animal is worth a good deal of money to the inquirer. If the gentleman who burned up fifty dollars' worth of mattresses suspected of harbouring bed bugs had consulted us before, instead of after, burning them, he would have learned that the suspected insects had probably been brought into his summer home by bats and were bat bugs and not bed bugs. Sometimes whole collections are sent for identification. No biologist can be an authority on more than a few groups of animals and if he is making a biological survey of an area he must send many of the animals, for instance, fishes, molluscs, leeches, insects, spiders, etc., somewhere for correct identification. The identification of such material is one of the recognized functions of natural history museums. The Royal Ontario Museum of Zoology is the only place in Canada where the identification of some groups of animals can be made. For other groups specimens must be sent to other Canadian institutions or to the United States.

The Museum is always delighted to supply information on natural history matters whenever possible.

## JAMES HENRY FLEMING
1872-1940



JAMES HENRY FLEMING

James Henry Fleming, Honorary Curator, Division of Birds, Royal Ontario Museum of Zoology, died at his home in Toronto on June 27, 1940. Mr. Fleming was a well-known figure in world-wide ornithological affairs. He had acted as Canadian representative at several International Ornithological Congresses in Europe and had served three years as President of the American Ornithologists' Union (1932-5).

In 1927 Mr. Fleming consented to act as an adviser to our Museum and was duly appointed an Honorary Curator by the Board of Trustees. His great knowledge of birds of the world became a valued asset of the Museum and his practical and constant interest in many phases of Museum work was always helpful and encouraging to members of the staff.

Mr. Fleming was one of the most enthusiastic, well-informed, and effective pioneers of the museum idea in Canada. Long before the Royal Ontario Museum of Zoology was founded he had undertaken the building of a private ornithological museum. His life was devoted to this enterprise and he always had in mind that he was preserving valuable material for the ultimate enrichment of some public Canadian institution.

It has come to pass that the Royal Ontario Museum of Zoology was chosen by him as the final repository of his library and research collections. The Fleming bequest is unparalleled in the history of the Museum of Zoology. In many respects it could never be duplicated. The library, as yet incompletely catalogued totals several thousand volumes consisting of the principal literature on birds in the English language. Complete sets of periodicals and an extensive collection of unbound scientific papers provide a rich source for reference and remove a serious and long-felt deficiency in the Museum's files of scientific literature.

The Fleming bird collection nearly doubles the research material

which had been brought together by the Museum. It totals 32,267 specimens. Actually the Fleming collection is more representative of the birds of the world than was the Museum's collection. Of the 166 families of modern birds (Wetmore's List, 1940) only three are unrepresented in the Fleming collection, and of the approximately 2,600 modern genera it contains 2,073. Extinct birds, rare specimens from island areas, North American birds from their South American winter homes, a number of types, many topotypes, numerous long series showing geographic and other variations combine to make the Fleming collection an invaluable one.

The Royal Ontario Museum of Zoology and scientific workers everywhere will for all time owe a debt of gratitude to James Henry Fleming. Apart from his published notes and papers (numbering more than eighty titles) and the many direct and indirect aids rendered to workers during his lifetime, the effect of Mr. Fleming's labours will continue to be felt. His collection will always be a reservoir of facts, and his library, a source of information. The Museum and its staff are indeed appreciative of Mr. Fleming, the friend and adviser, grateful for his bequest and happy that we are in a position to accept and care for the treasures left by him.

## A HISTORY OF THE COLLECTIONS OF THE ROYAL ONTARIO MUSEUM OF ZOOLOGY

In 1939 the Royal Ontario Museum completed the first quarter-century of its existence. However, at the time of the official opening by his Royal Highness, the Duke of Connaught, Governor-General of Canada, in March, 1914, the Museum contained no zoological collection. It was not until May, 1915, that the first zoological material was moved from the Museum of the University Biological Department.

The opening of the Royal Ontario Museum marked the culmination of long years of dreaming and planning and active collecting on the part of many individuals and institutions. From the earliest days of settlement in Upper Canada, naturalists had planned and worked for a museum to exhibit the animal life of the area. Probably the earliest attempt to found a museum was that of Charles Fothergill, who came to Upper Canada in 1817, was King's Printer from 1822-6, and represented Durham County in the Legislative Assembly from 1825-9. Fothergill, in conjunction with Dr. Rees, a mineralogist, and Dr. Dunlop, was instrumental in petitioning the Legislative Assembly in 1833, urging the establishment of a museum at York (Toronto). These gentlemen succeeded in obtaining from the Government a grant of land on the Garrison Commons for their museum. Although the project was patronized by successive Lieutenant-Governors and

the site provided by Order-in-Council, it fell through on Fothergill's death in 1840 and on the destruction by fire of his collection of objects shortly afterwards.

The collections of the Biological Department from which the nucleus of the Royal Ontario Museum's zoological material came had their origin in the early days of the University. There is in the possession of the Museum an early catalogue of the collections begun by Professor Hincks in 1857. Hincks had been appointed Professor of Natural History in the University in 1853.

When University College was gutted by fire on February 14, 1890, the Museum, which had been housed in what is now known as West Hall, was moved out, although it had suffered comparatively little from the fire. Following this, the recently completed Biological Building was enlarged to accommodate the Museum. For many years the museum wing of this building housed not only the zoological collections, but also those of mineralogy, geology, and palaeontology.

Under the direction of Professor Ramsay Wright, Head of the Department of Biology from 1874 to 1912, the Museum was developed into the finest zoological collection in Canada. University funds supplemented by donations from private benefactors were used to purchase specimens representing all of the important groups of animals. The one weakness of the collection at this stage of its existence was in the dearth of Canadian material; up to this time the Canadian fauna had received comparatively little study from either zoologists or naturalists.

The first important collection of Canadian material acquired by the Biological Museum was that of Dr. J. H. Garnier, a naturalist-physician of Lucknow, Ontario. This collection, received in 1891, was especially rich in amphibians and reptiles, but contained some birds and mammals as well. Although it too was chiefly of foreign origin, representatives of Ontario forms were included. Addition of other Canadian material resulted from the work of naturalists including Sir Casimir Gzowski, the Rev. John Doel, Mr. J. H. Ames, and the Biological Society of Ontario.

Some idea of the rate of growth of the collections may be had from statements of the number of specimens in the Museum at different stages of its development. An early catalogue indicates that 735 specimens were in the museum in 1870. In 1897, according to an article on the Museums of Canada in the *Report* of the British Association for the Advancement of Science for that year, "The Biological Museum contains between 15,000 and 20,000 specimens, of which the geological department includes about 12,000 specimens. The zoological collections alone number 8,000 specimens, and include specimens of living and fossil representatives of the various classes and

orders of the animal kingdom, as well as a large series of models for educational purposes." A catalogue of accessions for 1900 to 1912 inclusive lists 4,900 specimens received during that period. At the time of the establishment of the Royal Ontario Museum, the collections of the Biological Museum probably included in the neighbourhood of 20,000 zoological specimens.

Although the University Department of Biology had most to do with the development of the collections which came to the Royal Ontario Museum of Zoology, on its founding other institutions helped to foster the museum idea in Toronto and contributed material ultimately incorporated in the early collections. One of the most important of these was the Canadian Institute (now Royal Canadian Institute) founded in 1849: the formation of a "provincial museum" was one of the objects for which the Institute was established. The natural history collections of the Canadian Institute which were later transferred to the Royal Ontario Museum appear to have had their inception in 1885 when the Natural History Society of Toronto amalgamated with the Canadian Institute, bringing with it its collections of natural history material and forming the Biological Section of the Institute. Later there was organized within the Biological Section an Ornithological Subsection. In the minutes of the meetings of this subsection, mention is made in a number of places of steps being taken to add to the bird collection. In a report on "The State of the Principal Museums in Canada and Newfoundland" by Henry M. Ami, published in the *Report* of the British Association for the Advancement of Science for 1897, pp. 62-74, the Canadian Institute Museum was said to contain 729 Canadian birds, 329 Canadian birds' eggs, 150 foreign birds, 62 mammals, 200 reptiles, and 2,000 insects. The collection had probably increased little beyond this when it was transferred to the Royal Ontario Museum of Zoology in 1924.

The Toronto Normal School was another centre of development of the museum idea in Toronto. The Legislature of 1852-3 appropriated £500 per annum to be used by the Museum of the Normal School for the purchase of books, publications, specimens, models, objects relating to education and other departments, which included "Artificial productions of Canada, especially referring to mineralogy, zoology, agriculture and manufacturing." Until after 1896, natural history material seems to have occupied a very subsidiary position in the collection of the Normal School. With the addition of a third storey to the building about 1896, the Museum was considerably enlarged, and the hastily prepared collection of birds and mammals was included at this time.

In 1906, the Museum was raised to the status of Provincial Museum. Dr. William Brodie was appointed first Provincial Biologist

in 1903, and his extensive collections of biological material acquired by the Museum. The old collection of birds and animals was in part replaced by the purchase of new material from Mr. John Maughan Jr., and Mr. Maughan was commissioned to complete the exhibition collections.

Mr. Charles W. Nash, who became a lecturer on biology for the Ontario Department of Agriculture, began in 1900 a series of check-lists of vertebrates for the Museum. This series, reissued as *The Manual of the Vertebrates of Ontario*, was an important contribution to our knowledge of the vertebrate fauna of the province. Mr. Nash prepared a large number of casts of fish, reptiles, etc., for the Museum and in 1908 presented his private collection of biology to the Museum. In 1910, Mr. Nash succeeded the late Dr. Brodie as Provincial Biologist. With such men as Boyle, Brodie, Nash, and Maughan on the staff, the Provincial Museum became the centre of information for teachers and students of natural history. Mr. Nash died in 1926, and in 1933 the Museum was closed, the archaeological and biological material going to the Royal Ontario Museum.

The Natural History Society of Toronto, to which reference has already been made, was the first society in Toronto devoted exclusively to a study of the natural sciences; it was incorporated in 1878. This society was founded by Dr. William Brodie. This group affiliated with the Canadian Institute as its Biological Section on January 23, 1886, and in 1893 drew away from the Institute and formed the Biological Society of Ontario. The latter organization accumulated a collection of bird and mammal skins which was given to the Biological Museum in 1911.

Professor Ramsay Wright retired as Head of the Department of Biology in 1912 and was succeeded by Dr. B. A. Bensley, and it was at Dr. Bensley's request that the Board of Trustees established the Royal Ontario Museum of Zoology. The original resolution of the Board dated October 16, 1913, created a section known as the Royal Ontario Museum of Natural History but the name was changed on April 24, 1914, to the Royal Ontario Museum of Zoology. The zoological collections were given a gallery 104 by 62 feet at the north end of the upper floor of the original building. As a nucleus of exhibition material, several hundred specimens were transferred from the Biological Museum. In the selection of this material, preference was given to Canadian animals, although such brilliant and striking exotics as birds of paradise, parrots, and humming birds were included, also a collection of foreign game birds. The exhibit thus assembled included a fairly representative collection of the birds of Canada, a much less adequate representation of Canadian mammals, twelve cases of insects, chiefly Canadian. Fishes, amphibians, reptiles, and

invertebrates other than insects were poorly represented, although there were included casts of the five species of Pacific salmon presented by the Government of British Columbia.

The needs of a public museum such as those of the Royal Ontario Museum could not be adequately met either in the amount or nature of material available in the Biological Museum and steps were soon taken to augment it by the preparation of specimens specially suited to the needs of the new museum. Additions to the mammal collection were made through the mounting of such species as wolves and deer by taxidermists employed on a temporary basis. Using material from the University Department of Biology, systematic series of many invertebrate groups were prepared by Dr. Walker and Mr. Kurata. Many of these, including spiders, crustaceans, worms, etc., were mounted in alcohol in cylindrical museum jars, but a collection of mollusc shells and dried starfish was displayed in table cases. Contributions of material from public bodies and private individuals were soon forthcoming.

Mr. T. B. Kurata, who had been transferred to the Royal Ontario Museum on the organization of the Museum of Zoology, was at first the only member of the staff besides Dr. Bensley, Director, and Dr. E. M. Walker, Assistant Director, both of whom had heavy responsibilities in the Department of Biology. During the next two years, the staff was increased by the appointment of Messrs. E. B. S. Logier and L. L. Snyder, and exhibits more in line with modern museum practice than those transferred from the Biological Museum were prepared for the new galleries.

It was not long before the original Royal Ontario Museum building was found to be inadequate for the rapidly expanding exhibits and research material. This was especially true in the case of the Museum of Zoology, which, instituted after the museum had been organized on the basis of only four components, Archaeology, Geology, Mineralogy, and Palaeontology, could be given only very limited space. As a matter of fact, it was only after moving into the 1931 extension that the Museum of Zoology was able to organize on the basis of a properly constituted museum. The work of the Museum since that time has been outlined in the *Bulletin* beginning with number 5.

In the development of the Royal Ontario Museum of Zoology, it has always been the aim to keep a proper balance between exhibits and research, that is, between the popular and scientific phases of museum work.

On the exhibition side, the aim has been to make the exhibit tell its own story with the minimum of descriptive label. This is accomplished in part by the provision of accessory material designed to suggest something of the habitat in which the animals live. This

trend in museum exhibition has culminated in the habitat group which depicts an animal amid a representation of its natural surroundings. Usually such a group includes a panoramic picture as a background. Only two large habitat groups have so far been attempted, those illustrating the black bear and the passenger pigeon, but a series of twenty-four smaller exhibits of the same type illustrate the habitat of a number of common Ontario mammals, birds, and reptiles. A series of new type exhibits is now in course of preparation. One of these is illustrated on the cover of this *Bulletin*. Since the opening of the larger galleries in 1932, many of the larger mammals of Canada for which space was not available in the original building have been added to the exhibition series. The fishes, amphibians, and reptiles of Canada are represented by realistically coloured replicas of actual specimens.

Not all a museum's specimens are on exhibition; in every large natural history museum, there are hundreds of specimens preserved in a research collection for every one on exhibition in the public galleries. One of the primary functions of a Museum of Zoology is to study the animal life, particularly of the region it serves. The specimens on which such studies are based are secured chiefly by field surveys carried out by the Museum's own staff, but some material is obtained by donation, by purchase, and by exchange. The need that existed prior to the establishment of the Royal Ontario Museum for an institution to investigate the animal life of Ontario is shown by the fact that, since its inception, approximately sixty species of vertebrates not previously known to occur in Ontario have been found within the province.

Following are the numbers of specimens in the various groups contained in the Museum's research collections at the end of 1939: mammals, 12,000; birds, 33,372; reptiles, 1,680; amphibians, 4,979; fishes, 10,371 (lots); insects, 250,000; spiders, 4,496 (lots); molluscs, 20,043 (lots); miscellaneous invertebrates, 2,164 (lots). In the case of fish, spiders, molluscs, etc., a lot often contains a number of specimens collected in the same place at the same time.

The staff of the Royal Ontario Museum of Zoology at the present time consists of the following:

J. R. Dymond.....Director
L. L. Snyder.....Assistant Director and Curator, Division of Birds
T. B. Kurata.....Technologist and arachnologist
E. B. S. Logier.....Artist and herpetologist
J. L. Baillie.....Cataloguer, Division of Birds
T. M. Shortt.....Associate and Artist, Division of Birds
C. E. Hope.....Assistant, Division of Birds
J. G. Oughton.....Associate in Invertebrate Zoology
F. A. Urquhart.....Lecturer and entomologist

E. C. Cross.....Acting Curator, Division of Mammals
E. G. McDougall.....Librarian
C. E. Corfe.....Assistant, Division of Insects
K. A. Nielsen.....Taxidermist
L. A. Prince.....Assistant, Division of Mammals
S. C. Downing.....Cataloguer, Division of Mammals
Edna Boissonneau.....Secretary
Isobel Radforth.....Research assistant in ichthyology

Part-time assistance is given by the following:

E. M. Walker.....Honorary Curator of Invertebrate Zoology
John Edmonds.....Honorary Associate in Ornithology
Phyllis Oughton.....Secretarial assistant
Audrey Shortt.....Photographer
W. B. Scott.....Assistant, Division of Fishes

## PUBLICATIONS

The following Museum publications have appeared during the past two years:

CONTRIBUTIONS. Price twenty-five cents per copy.

15. The fishes of the Ottawa region, by J. R. Dymond. 43 pages.
16. The birds of the vicinity of Lake Nipissing, Ontario, by W. E. Ricker and C. H. D. Clarke. 25 pages.
17. The summer birds of Yakutat Bay, Alaska, by T. M. Shortt. 30 pages.
18. History of the Royal Ontario Museum of Zoology, by J. R. Dymond. 52 pages.

HANDBOOKS. Price thirty-five cents.

4. The reptiles of Ontario, by E. B. S. Logier. 63 pages; describes 18 kinds of snakes, 9 turtles, and one lizard known to occur in Ontario.

OCCASIONAL PAPERS. Price ten cents.

5. On *Melospiza melodia* in Ontario, by J. H. Fleming and L. L. Snyder.

MIMEOGRAPHED CIRCULARS.

The keeping of fish, amphibians and reptiles in aquaria and terraria, by E. B. S. Logier.
Hints to collectors of land and freshwater molluscs, by J. G. Oughton.
Aids to the study of nature in Ontario—a list of books and other publications suitable for teachers and others interested in the study of nature.
Hibernation, the winter sleep of animals.
The smelt in the Great Lakes.

Additional publications in journals.

Baillie, J. L. Breeding of the lesser scaup duck in southern Ontario. Wilson Bull. 51: 184. 1939.
A northern occurrence of the grasshopper sparrow. Wilson Bull. 51: 186. 1939.
The northern chipmunk in Parry Sound District, Ontario. Can. Field-Nat. 53: 59. 1939.

Four additional breeding birds of Ontario. Can. Field-Nat. 53: 130-1. 1939.
King rail breeding in southern Ontario. Auk 57: 109-10. 1940.
A gathering of swifts. Can. Nature 2: 44. 1940.
The summer distribution of the eastern evening grosbeak. Can. Field-Nat. 54: 15-25. 1940.

CORFE, C. E. *Celerio lineata* in Ontario. Can. Field-Nat. 53: 58. 1939.

CROSS, E. C. Arthritis among wolves. Can. Field-Nat. 53: 2-4. 1940.
Periodic fluctuations in numbers of the red fox in Ontario. Journ. Mam. 21: 294-306. 1940.

DYMOND, J. R. The study of animal populations. Rod and Gun in Can. 40:17-18, 26-27. 1939.
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Observations on the burrowing wolf spider, *Lycosa missouriensis* Bks. Can. Field-Nat. 43: 84-85. 1939.

LOGIER, E. B. S. Butler's garter snake in Ontario. Copeia, no. 1. 1939.

OUGHTON, J. G. An observation on *Bulimnea megasoma*. Nautilus 52: 106. 1939.
The burrow of an Arctic spider, *Lycosa asivak* Emerton. Can. Field-Nat. 53: 123-124. 1939.
Shells you should know. Can. Nature 1: 37. 1939.
More common shells. Can. Nature 2: 45. 1939.
(with R. V. WHELAN). Land mollusks of Smoky Falls, Cochrane District, Ontario. Can. Field-Nat. 53: 99-101. 1939.
(with A. LA ROCQUE). Francis Robert Latchford, 1856-1938. Can. Field-Nat. 53: 111-113. 1939.
(with the Rev. H. B. HERRINGTON). Land molluscs of Hastings County, Ontario. Can. Field-Nat. 54: 42-43. 1940.
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A visit to the Arctic of Eastern Canada. Nautilus 54: 1. 1940.

SHORTT, T. M. Chickadees in art. Can. Nature 2:19. 1939.
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SNYDER, L. L. Great Plains races of sharp-tailed grouse. Auk 56: 184-185. 1939.
A plan of Ontario subdivisions and their names for naturalists. Can. Field-Nat. 53: 22-24. 1939.
Two birds with one stone. Can. Field-Nat. 53: 11-12. 1939.

URQUHART, F. A. The American locust *Schistocerca americana* Drury (Orthoptera). Can. Field-Nat. 53: 24-25. 1939.
Natural history in the classroom. The School 27: 575. 1939.
The dobson-fly. Can. Nature 1:15. 1939.
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